

CLAIMS

What is claimed is:

- 5 1. A distributed system, comprising:  
a set of nodes that communicate via a set of  
sub-nets of the distributed system, the nodes each  
having a local clock, the nodes maintaining time  
synchronization among the local clocks by  
10 transferring a set of timing data packets via the  
sub-nets;  
time synchronization bridge that coordinates  
time synchronization among the sub-nets in response  
to the timing data packets.
- 15 2. The distributed system of claim 1, wherein the  
time synchronization bridge maintains an internal  
time and synchronizes the internal time to a local  
clock on a selected one of the sub-nets.
- 20 3. The distributed system of claim 2, wherein the  
time synchronization bridge uses the internal time to  
synchronize the local clocks on the remaining ones of  
the sub-nets.
- 25 4. The distributed system of claim 1, wherein the  
time synchronization bridge maintains an internal  
time and synchronizes the local clocks to the  
internal time.
- 30 5. The distributed system of claim 1, wherein the  
time synchronization bridge determines a master clock  
in the distributed system in response to a set of

09860540-061201  
FOIA b7 - D

clock meta-data in the timing data packets and a set of clock meta-data associated with an internal time maintained by the time synchronization bridge.

5       6.    The distributed system of claim 5, wherein the clock meta-data associated with the internal time of the time synchronization bridge indicates a GPS time source.

10       7.    The distributed system of claim 5, wherein the clock meta-data associated with the internal time of the time synchronization bridge indicates an atomic clock time source.

15       8.    The distributed system of claim 5, wherein the clock meta-data includes an indication of quality of the corresponding local clock.

20       9.    The distributed system of claim 5, wherein the clock meta-data includes an indication a number of other time synchronization bridges traversed by the corresponding timing data packet.

25       10.   The distributed system of claim 5, wherein the clock meta-data includes an indication that the corresponding local clock is preferred as the master clock.

30       11.   A time synchronization bridge, comprising:  
          means for maintaining an internal time in the time synchronization bridge;  
          a set of synchronization modules corresponding to a set of sub-nets, each synchronization module

having means for adjusting the internal time in response to a set of timing data packets received via the corresponding sub-net and means for distributing the internal time via the corresponding sub-net.

5

12. The time synchronization bridge of claim 11, wherein each synchronization module includes a clock and means for synchronizing the clock in response to the timing data packets received via the corresponding sub-net.

10

13. The time synchronization bridge of claim 12, wherein the means for maintaining an internal time includes means for selecting one of the clocks as a primary clock in the time synchronization bridge such that the clocks synchronize to the primary clock.

15

14. The time synchronization bridge of claim 13, wherein the means for selecting includes means for selecting the primary clock in response to a set of clock meta-data contained in the timing data packets.

20

15. The time synchronization bridge of claim 11, wherein the means for maintaining an internal time comprises a central clock.

25

16. The time synchronization bridge of claim 15, wherein each synchronization module includes means for adjusting the central clock in response to the timing data packets received via the corresponding sub-net and means for selecting one of the synchronization modules to adjust the clock.

30

17. The time synchronization bridge of claim 16,  
wherein the means for selecting includes means for  
selecting one of the synchronization modules in  
response to a set of clock meta-data contained in the  
5 timing data packets.

18. The time synchronization bridge of claim 11,  
further comprising a GPS time source.

10 19. The time synchronization bridge of claim 11,  
further comprising an atomic clock time source.

09880540-061204  
T02T90-04503860